Electronic Payment Systems (EPS) are gaining popularity all over the world. An EPS consists of many component technologies which facilitate cashless payments for services. The focus of this thesis is on device associated technologies that an end customer uses to initiate an e-payment for a particular service via a Payment Service Provider (PSP). A technology solution in an EPS is developed by a Payment Solution Developer (PSD). The market between a PSP and a PSD is a B2B market. A PSD must understand and develop that combination of technology and service which will successfully diffuse. The success of a PSP therefore depends a lot on what a PSD develops. A theoretical framework to measure diffusion of e-payment technologies, services and their combinations in the B2B market was developed and empirically assessed in this thesis. Two concepts namely *concept of breadth* and *concept of spread* were defined. The concept of breadth and spread were applied to e-payment technologies, services and their combinations. The derived concepts namely *technology breadth*, *service breadth*, *technology spread*, *service spread* and *technology-service combination spread* were defined and measured. We then extended the concept of breadth to understand *utilization* of technologies and services within an EPS. Set theory was used to describe the framework.

A sample of 45 EPS was compiled from various sources. This secondary data of EPS consisted of 8 technologies and 16 services. The 8 technologies are Interactive Voice Response (IVR), text messaging using Short Messaging Service (SMS), text messaging using Unstructured Supplementary Service Data (USSD), mobile internet using Wireless Application Protocol (WAP), mobile application, Near Field Communication (NFC), Personal Computer (PC) internet and smart card. The 16 services are retail shopping payment, banking, health payment, insurance payment, mobile bill payment, mobile recharge, money transfer, movie ticket booking, parking fee payment, restaurant

payment, payment at sports/swimming club, toll payment, transportation payment, tuition fee payment, utilities payment, and vending machine payment. Three categories of PSPs namely core payment service providers (n=18), non-core payment service providers (n=12) and merchants (n=15) were identified from the 45 EPS.

Binomial proportion test was used to verify the concepts of breadth and spread. Spearman correlation was used to find correlation between the concept of breadth and spread of technologies and services. The 45 EPS in the sample were then grouped under three sub groups based on the categories of their PSPs. Binomial tests were used within each sub group to understand the preferences of technologies, services and their combinations by each category.

The results verified that certain e-payment technologies possess more breadth i.e., capability to deliver many e-payment services and certain e-payment services possess more breadth i.e., delivered by many e-payment technologies. A difference in diffusion i.e., spread of technologies, services and their combinations were observed. Details of these differences are discussed in this thesis for technologies, services and their combinations. A positive correlation was observed between the concept of breadth and spread. Specialization of technologies, services and their combinations within categories of PSPs were observed. Variations in utilization of technologies and services by EPS were observed.

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